Attachment C

APPROACH TO WRITING WATER QUALITY IMPACT SECTIONS

Because the overall alternatives to be evaluated in the EIR have not been fully defined, the suggested approach is intended to develop information that will be needed however the alternatives are ultimately packaged. The object is to prepare as much material in as final form as possible, early in the process. It will be easier to revise this material as necessary to fit the ultimate definition of alternatives than to begin preparing narrative materials later in the EIR process. It is suggested that the impact sections we prepare now contain three parts; 1) Supplementary descriptive material on the action, if it is not fully explained in the "Description of Alternatives" chapter, 2) Description of impacts with a determination of whether they are beneficial, neutral, adverse but insignificant, or adverse but significant, 3) Possible mitigation measures.

1. Supplementary description of action

Ideally, all actions will be fully described in the 'Description of Alternatives" chapter of the EIR. Because the overall alternatives are not fully defined, and because the actions themselves include many internal options, the best approach to use at this time is to describe the action to be analysed as the first part of each section within the "Environmental Consequences" chapter. This will ensure that analysts are all working using the same description of the action. At a later time, the descriptive material could be moved to the "Description of Alternatives" chapter.

2. Description of impacts

Impacts are to be analysed at a program level rather than at a project level. Using the Urban and Industrial Runoff Water Quality Action as an example, the overall effect of implementation of urban and industrial stormwater controls on water quality in the delta and major streams will be analysed in as much detail as is possible. The impacts of eroded sediment from the construction of hundreds of small detention basins in urban areas will be noted but not analysed. The impacts of the former will be long-term and regional in scale. The impacts of the latter will be short-term and localized

The steps in the impact analysis will be:

a. Estimate current pollutant emissions attributable to source (e.g. agricultural subsurface drains)

b. Determine effectiveness of action in reducing pollutant emissions

c. Estimate change in wasteloads to water bodies attributable to action

d. Estimate change in water quality parameter concentrations in target water bodies attributable to action

e. Interpret what changes in water quality mean and assess their significance.

Steps a, b and c are necessary to make a reasonably quantitative assessment of impacts and to come to a conclusion with respect to their significance. Step d is desirable but may not always be possible or essential. Steps a, b, c and d are primarily a matter of computation tempered by some professional judgement. Step e is largely a matter of interpretation and professional judgement.

Interpreting the meaning of changes in water quality without reference to the health of aquatic life is difficult. If water quality and aquatic biota are discussed in separate impact sections them the results of the water quality impact analysis (Steps a,b,c and d) have to be exported to the aquatic biota section for interpretation (Step e). To avoid this awkwardness, the impact sections for water quality and aquatic life could be combined.

3. Possible mitigation measures

Most of the common program elements are intended to improve water quality. Because their implementation will produce beneficial rather than adverse effects, no mitigation measures will be necessary.

When an action has significant adverse environment consequences an attempt must be made to devise mitigation measures which will reduce the adverse impacts to an insignificant level. A determination of whether this is possible should be made in the impact section. Significant impacts that cannot be mitigated to insignificance are regarded as unavoidable and must be identified as such in the EIR.

MODEL IMPACT SECTION

(The following write up provides some skeletal verbage for the impact analysis. It is intended only to illustrate the approach. Insufficient work has been performed to date to draw any conclusions)

WATER QUALITY ACTION X- URBAN AND INDUSTRIAL RUNOFF

1. SUPPLEMENTARY DESCRIPTION OF ACTION

Until 1987, discharges from urban and industrial storm drains were unregulated. In that year, the Clean Water Act was amended to more specifically address urban and industrial stormwater. The amended act requires that discharges of runoff from urban and industrial lands to the waters of the United States be subject to permission of the federal government, or the state government in states such as California, where the U.S. Environmental Protection Agency has delegated responsibility for implementation of the Clean Water Act. Currently, all discharges of stormwater from urban areas with a population greater than 100,000 and from industries within certain standard industrial classifications must be the subject of a permit issued under the National Pollutant Discharge Elimination System (NPDES). Large cities and the affected industries submitted stormwater discharge permit applications in the early 1990s. Most have received permits and are operating in accordance with permit conditions. Permits require the implementation of certain best management practices (BMPs) as a condition of discharge and do not contain numerical effluent limits.

To a considerable extent the stormwater program can be considered as experimental. Because there is so little experience with large scale application of stormwater controls, the effectiveness of the current BMP-based program is unknown. Most discharge permits contain requirements for monitoring. Monitoring results will provide a means of judging effectiveness and a basis for future modifications to permit conditions.

The water quality action for urban and industrial runoff includes various options for reducing pollution or the effects of pollution from this source. They include:

- Option X-1 Source control- enforcement of existing regulations
- Option X-2 Source control- provision of incentives
- Option X-3 Better planning of new developments
- Option X-4 Treatment of a portion of urban and industrial runoff

(Add a complete description of options)

2. DESCRIPTION OF IMPACTS

Estimated pollutant loads attributable to urban and industrial runoff

The quality of urban runoff in the United States was characterized in the mid-1980s as part of the U.S. Environmental Protection Agency's National Urban Runoff Program (NURP). NURP reported that urban runoff is quite variable. NURP found that the quality of runoff from residential and commercial lands was significantly different from runoff from undeveloped lands.

In the early 1990s, cities with populations greater than 100,000 sampled urban runoff in support of their stormwater discharge applications under NPDES. Within the study area, the cities of Sacramento, Vallejo, Fairfield, etc sampled runoff from different land use types. The average quality of urban runoff sampled in these cities is shown in Table 1. In the following analysis it was assumed that these average values can be used to represent runoff water quality from all urban and industrial lands in the study area.

The study area boundaries enclose about 30 million acreas of land. It is estimated that 600,000 acres or about 2% of the total are devoted to urban and industrial uses. The estimated total annual pollutant annual load contained in runoff from urban and industrial lands for selected parameters is shown in Table 2. This estimate is the total pollutant load discharged to surface waters throughout the study area. Most, but not all, of these pollutants will eventually reach the delta. Some non-conservative pollutants such as BOD, ammonia and microbial pathogens may decay before arrival. Others, metals adsorbed on organic particles for example, may settle to the bottom of a stream where they may remain for years until moved downstream by an unusually large stream discharge.

Table 2 also shows the total pollutant load for the same parameters as they enter the delta from the Sacramento and San Joaquin Rivers and other smaller tributaries. The proportion of total load attributable to urban and industrial runoff is estimated assuming conservatively that the entire urban runoff load reaches the delta. In no cases, can more than 20% of the total load be attributed to urban runoff.

Effectiveness of action in reducing waste loads

The effectiveness of the action depends on the option selected. Table 3 shows the predicted removal rates for each of the four action options noted above.

Estimated change in waste loads attributable to action

Using the estimates of effectiveness noted above waste loads attributable to urban and industrial runoff were calculated after implementation of the action. Table 4 compares total waste loads from urban and industrial runoff in 2020 if no action was taken, to waste loads if the various options were implemented.

Effects of change in waste loads on water quality

No mathematical water quality simulation modeling was conducted to predict in-stream water quality resulting from control of urban and industrial runoff. The following observations can be made based on the estimated alterations in waste loads. Urban and industrial runoff waste loads are primarily discharged during the winter months when dilution in surface water bodies is at a maximum. They are not discharged in dry periods when water quality in surface water bodies is at its worse. During wintertime high flows, urban and industrial runoff has only a minor influence on surface water quality.

Water quality impacts and their significance

Urban and industrial controls are likely to have a modest but insignificant long-term beneficial impact on delta water quality. Greater benefits may accrue in the water bodies immediately adjacent to urabn and industrial areas. Because urban and industrial runoff controls have no long-term significant adverse effects on water quality no mitigation is necessary. Construction of certain types of structural controls could have Potentially significant short-term adverse effects on water quality. It is expected that these short-term effects can be reduced to insignificance by appropriate mitigation measures.

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Table 1

Urban Runoff Quality in Study Area

Constituent	Unit	Residential/Commercial	Industrial
BOD	mg/l	9	15
COD	mg/l	60	80
TSS	mg/l	75	75
Ammonia (as N)	mg/l	0.1	0.1
Total Copper	μg/l	30	55
Total Lead	μg/l	18	25
Total Zinc	μg/l	120	130
Diazanon	μg/l	8	4

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Table 2

Pollutant Loads to Delta (tons/yr)

Constituent	Total Load	Urban/Industrial Runoff Load	% of total
Total dissolved solids	6,000,000	20,000	0.3
Ammonia	13,000	200	1.5
Nitrate	12,000	600	5.0
Total Phosphorus	6,000	120	2.0
Total Copper	600	8	1.3
Total Zinc	600	56	9.3
Diazanon			

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Table 3

Estimated Removal Rates for Runoff Controls (%)

Constituent	Control Option X-1	X-2	X-3*	X-4
Total dissolved solids	0	0	0	0
Ammonia	5	5	30	15
Nitrate	5	5	30	15
Total Phosphorus	5	5	30	15
Total Copper	0	5	50	25
Total Zinc	0	5	50	25
Diazanon	5	5	30	25

* Applies only to new development

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Table 4

Effects of Urban/Industrial Control Measures on Waste Loads

Constituent	No Action	Load to Delta (tons/yr) Control Options Implemented X-1	X-2	X-3	X-4
Total dissolved solids	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000
Ammonia	13,000	12,980			
Nitrate	12,000	11,900			
Total Phosphorus	6,000	5990			
Total Copper	600	600			
Total Zinc	600	600			
Diazanon	-	-			

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